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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/825,888	04/16/2004	Ananda K. Bandyopadhyay	NOVLP088/NVLS-2882	8591

22434 7590 12/27/2006  
BEYER WEAVER & THOMAS, LLP  
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EXAMINER
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SMITH, BRADLEY

ART UNIT	PAPER NUMBER
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2891

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	12/27/2006	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

# Office Action Summary

Application No.

10/825,888

Applicant(s)

BANDYOPADHYAY ET AL.

Examiner

Bradley K. Smith

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 21 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-53 and 55-57 is/are pending in the application.
- 4a) Of the above claim(s) 1-33, 36, 38, 40, 42 and 44 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 34, 35, 37, 39, 41, 43, 45, 46- 52, 53, and 55-57 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 4/16/04 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>9/21/06, 11/13/06</u>   | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 34, 35, 37, 46-48, 52, 53, and 55-57 are rejected under 35 U.S.C. 102(e) as being anticipated by Waldfried et al. Waldfried et al. disclose (a) exposing the dielectric film to ultraviolet radiation with a first light intensity during a first time increment, (b) exposing the dielectric film to ultraviolet radiation with a second light intensity during a second time increment (see columns 8 and 9). (The examiner understands that either the first or second exposure could be 0 and that one cure step would be absent therefore Waldfried discloses repeated steps of curing the CDO.) With regards to claims 35 and 37 Waldfried et al disclose the film is a porous CDO film( see column 4). With regards to claim 46, Waldfried et al disclose the first and second light intensities change (see columns 8 and 9). With regards to claim 47, Waldfried et al disclose the first light intensity is about 0 (the examiner understands claim this to also mean the absence of step a or b). With regards to claim 48, Waldfried et al disclose the UV is provided by one source. With regards to claim 52, Waldfried et al disclose the time ranging from 1 second to 300 seconds. With regards to claim 53, Waldfried et al disclose wavelengths

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in the range of 100-600nm (see column 8). With regards to claim 55-57, Waldfried et al disclose atmospheric pressure, purge gasses and a constant substrate temperature between 400-450 deg C. (see columns 7 and 8).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 39 is rejected under 35 U.S.C. 103(a) as being unpatentable over Waldfried et al. Waldfried et al disclose the claimed invention except for the hardness of the porous dielectric film increases by 0.9 GPa. It would have been obvious to one of ordinary skill in the art at the time the invention was made to increase the hardness by a certain amount, since it has been held the discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch 617 F.2d 272, 205 USPQ 215(CCPA 1980). Furthermore a harder dielectric will give the dielectric more strength and the UV cure is used to improve the strength and elasticity with out affecting the pore structure or the electrical properties (see Waldfried column 7 lines 36-41).

Claim 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over Waldfried et al. Waldfried et al disclose the claimed invention except for the modulus of the porous dielectric film increases by 5.0 GPa. It would have been obvious to one of ordinary skill in the art at the time the invention was made to increase the modulus by a

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certain amount, since it has been held the discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch 617 F.2d 272, 205 USPQ 215(CCPA 1980). Furthermore a increase in the modulus will give the dielectric more elastic and the UV cure is used to improve the strength and elasticity with out affecting the pore structure or the electrical properties (see Waldfried column 7 lines 36-41).

Claim 43 is rejected under 35 U.S.C. 103(a) as being unpatentable over Waldfried et al. Waldfried et al disclose the claimed invention except for the porous dielectric film shrinks by no more than 25%. It would have been obvious to one of ordinary skill in the art at the time the invention was made to keep the dielectric from shrinking too much, since it has been held the discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch 617 F.2d 272, 205 USPQ 215(CCPA 1980). Furthermore to keep the dielectric from shrinking too much will prevent warpage and damage to layers adjoining the dielectric layer and the UV cure is used to improve the strength and elasticity with out affecting the pore structure or the electrical properties (see Waldfried column 7 lines 36-41).

Claim 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over Waldfried et al. Waldfried et al disclose the claimed invention except for the dielectric not changing by more than 8%. It would have been obvious to one of ordinary skill in the art at the time the invention was made to keep the dielectric from changing to much, since it has been held the discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch 617 F.2d 272, 205 USPQ 215(CCPA

1980). Furthermore keeping the dielectric constant from changing too much will not impact the device characteristics and the UV cure is used to improve the strength and elasticity with out affecting the pore structure or the electrical properties (see Waldfried column 7 lines 36-41).

Claim 49 is rejected under 35 U.S.C. 103(a) as being unpatentable over Waldfried et al as applied to claim 34 above, and further in view of Retschke et al (US 2002/0141024). Waldfried et al disclose the claimed invention except for modulating the UV light source. However Retschke et al. disclose that it is well known to modulate the UV light (paragraph 0017). Therefore it would have been obvious to one of ordinary skill in the art at time the invention was made to combine the teachings of Waldfried et al, and Retschke et al because modulating the UV is well known in the art, and the modulation could enable one to treat different types of dielectrics materials

Claim 50 is rejected under 35 U.S.C. 103(a) as being unpatentable over Waldfried et al as applied to claim 34 above, and further in view of Retschke et al (US 2002/0141024). Waldfried et al, and Retchke et al discloses the claimed invention except for the UV cure has a duty cycle from 1% to 90%. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have duty cycle range between 1% and 90%, since it has been held the discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch 617 F.2d 272, 205 USPQ 215(CCPA 1980), and changing the duty cycle would let one alter the properties of the dielectric material as desired.

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Claim 51 is rejected under 35 U.S.C. 103(a) as being unpatentable over Waldfried et al as applied to claim 34 above, and further in view of Retschke et al (US 2002/0141024). Waldfried et al, Retschke et al discloses the claimed invention except for the modulated UV has a period of 1 microsecond and 5 minutes. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have duty cycle range between 1 microsecond and five minutes, since it has been held the discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch 617 F.2d 272, 205 USPQ 215(CCPA 1980), and changing the time cycle would let one alter the properties of the dielectric material as desired.

### ***Response to Arguments***

Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.

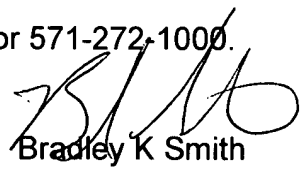
### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bradley K. Smith whose telephone number is 571-272-1884. The examiner can normally be reached on 10-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Baumeister can be reached on 571-272-1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Bradley K Smith  
Primary Examiner  
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